

Abstract of the Disclosure

A graphite nanofiber material herein provided has a cylindrical structure in which graphene sheets each having an ice-cream cone-like shape whose tip is cut off are put in layers through catalytic metal particles; or a structure in which small pieces of graphene sheets having a shape adapted for the facial shape of a catalytic metal particle are put on top of each other through the catalytic metal particles. The catalytic metal comprises Fe, Co or an alloy including at least one of these metals. The material can be used for producing an electron-emitting source, a display element, which is designed in such a manner that only a desired portion of a luminous body emits light, a negative electrode carbonaceous material for batteries and a lithium ion secondary battery. The electron-emitting source (a cold cathode ray source) has a high electron emission density and an ability of emitting electrons at a low electric field, which have never or less been attained by the carbon nanotube. The negative electrode carbonaceous material for batteries has a high quantity of doped lithium and ensures high charging and discharging efficiencies. Moreover, the lithium ion secondary battery has a sufficiently long cycle life, a fast charging ability and high charging and discharging capacities.